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NATURALNESS AND CONSERVATION IN FRANCE

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ABSTRACT. This article discusses the ecological and cultural criteria underlying the management practices for protected areas in France. It examines the evolution of French conservation from its roots in the 19th century, when it focused on the protection of scenic landscapes, to current times when the focus is on the protection of biodiversity. However, biodiversity is often socially defined and may not represent an ecologically sound objective for conservation. In particular, we question the current approach to protecting a specific type of biodiversity that is at the basis of traditional landscape but does not value systems that are left to develop naturally (i.e., without significant human intervention). We present several examples of current attempts in France and Europe to managing traditional ecosystems and then discuss the values that exist in systems that develop naturally. We feel the latter systems often have much to offer in terms of biodiversity as well as providing important sites for the study of dynamic ecological communities in an ever-changing world.

KEY WORDS: Biodiversity, conservation, France, naturalness, protected areas management

1. INTRODUCTION

Concepts such as biodiversity, naturalness, and benchmarks are frequently used in conservation and are strongly linked to ethical and social values (for a definition of the concepts, in Europe and America, see Peterken, 1996; Larrère and Larrère, 1997; Sippi, 2004). In Eurasia, humans seem to have been hostile to wilderness as long ago as the Neolithic period. Even after the principles of domestication of wild animals had been widely applied, prehistoric people gave the impression of pursuing the actual or symbolic control of wild animals through taming, conservation in zoos, deification, and ritual hunting (Lion, 1992; Lion, 2006; Gernez, 2006). During historic times till recently, wilderness has generally been considered as chaotic, dangerous, and empty (Kalaora, 2001), and has been rejected as being beyond civilization. Among many examples, let us quote Buffon (1764), who considered wild landscapes as "*dangerous, ugly and synonymous of death*," and the famous painter and ornithologist Audubon, who in 1810 described

the Okefenokee marshes and the Mississipi delta as "*gloomy, pestilential, suffocating, horrible*"

Western society appreciates the familiar comforts of field and hedgerow and rejects the "fear of darkness in the trackless forest" (Peterken, 1996). This explains why all the painted landscapes of the romantic periods are humanized, with some sign of civilization even in deep forests, "*in the form of a building in the distance, a small grazed meadow among the trees, or the vision of the artist standing in an obscure part of the painting*."

French people have entirely adopted this point of view. References to biodiversity are associated with the harmony and the beauty of rural landscapes, i.e., mosaics of meadows, pastures, ponds, and small forests, resulting from traditional agriculture, forestry, and grazing in the 18th and 19th centuries—"*nature with an agrarian metabolism*" (Fischer-Kowalski and Weisz, 1998).

Because wilderness is an ethical problem, endangered nature is restricted, for most managers of French protected areas, to this manufactured form of nature that over the last five decades has fallen victim to intensive agriculture practices (plowing of grasslands, increased use of agro-chemicals, destruction of natural river systems). They simply forget how great has been the destruction of primeval habitats and species assemblages, i.e., old-growth forests and associated natural processes, since the Bronze Age. This may explain why information about the value of well-preserved portions of forests remaining in France is virtually nonexistent and why so little effort is made to preserve them. This is in marked contrast with the information available and the effort made to preserve old-growth forests in the United States, where books, conferences, and visits explain the intrinsic value of natural forests and wild fauna, even when dangerous to humans (personal observations in Olympic National Park, Yosemite National Park, Yellowstone National Park, and the Mississippi basin).

Similarly, the present-day emergence of spontaneous wild communities due to lack of local policy is seen as a danger for heritage landscapes, rather than being considered as an important and endangered component of biodiversity in a world ever more dominated by humans.

This new attitude, which reinforces the human tendency towards self-centeredness, sometimes verges on the absurd. Some environmentalists have even gone as far as to claim that the return of the forest threatens more bird species than the restructuring of the rural landscape or pesticides (Clemens, 2006). The notion that open areas are richer in biodiversity than the forests they replace is even used by livestock farmers as an argument against the reintroduction of the wolf, lynx, or bear—all symbols of wild nature (Benhammou, 2005).

Without denying the role that this form of protection can play in the light of the dramatic decrease in crop biodiversity caused by the intensification of agricultural practices, we think that it is also important to explore naturalness as another valuable form of protection. The aim of the present article is to elaborate in detail upon this alternative, with a few well-chosen examples.

2. THE THREE PHASES OF CONSERVATION

This opposition between anthropocentric nature and wilderness has, however, changed with the concept, which emerged during the 19th century, of aesthetic landscapes, originating partly in the efforts of intellectual communities at that time and of certain urban artists, such as the "naturalist" painters of Barbizon and Nancy. Concepts of wilderness coming from the United States have also played a significant role, particularly with respect to forests (Raffin, 2005). In France, painters were sensitive to the ecological disruptions stemming from rapid industrialization and helped to establish a number of legislative advances testifying to their influence (Matagne, 2002) as well as a law on "the protection of natural sites and monuments of artistic character" (Law of 21 April 1906; reformed in 1930 and still in effect today). This law protected a specific type of nature, one which was aesthetically pleasing (it also protected monuments and other works of art). This definition of nature included both rural and wild landscapes, such as mountains and forests. As it did not oppose economic development, activities like the eradication of the wolf, the slaughter of raptors, or the poisoning of "pest" species, it encountered little opposition.

The second phase of conservation in the last 200 years, "nature without man," began in the 1950s and 1960s in response to the excesses of post-war industrialization, known in France as the Thirty Glorious Years (les Trente Glorieuses). The combined effects of a more aggressive, expanding society that was rapidly consuming natural resources and a larger body of ecological and naturalist knowledge caused the view of nature to change.

In France, many of the legislative measures of this period sought also to create national parks or nature reserves, where it was proposed to regulate strictly, or ban outright, human activities, which were to be considered as sources of disturbance. However, unlike in America, agricultural or forestry activities in many protected areas never ceased.

This idea of autonomous nature was re-examined in the third period, which started in the 1990s. Since our land has largely been shaped by human activities, the concept of nature has been reduced to "people's nature" or rural nature. It seems any activity in a given area, be it due to a farmer,

a forester, a hunter or indeed a city-dweller, claims to protect threatened biodiversity. In contrast, the place accorded to certain remnant intact natural areas has become minimal in the greater scheme of conservation and is constantly reconsidered in the name of sustainable management. The evolution of present-day society is becoming more and more planned, under the guidance of a proliferation of articles and books that describe the correct way to "save biodiversity" (Meffe and Carroll, 1997)—this trend spans scientific research programs, conferences, international articles, and university courses.

3. THE CONCEPT OF NATURALNESS

Naturalness ascribes great intrinsic value to the spontaneity of functional processes. This is essentially an ecosystemic approach, because it does not emphasize a specific species or habitat. Of course, remote intact ecosystems are considered as highly valuable, as references approaching the original state of nature, but the concept proposes also to give weight to common, even exotic species or habitats, even if it loses certain elements typically considered as prestigious. Naturalness thus recontextualizes threatened ecosystems as it considers that each ecosystem possesses the same intrinsic value when left alone to develop spontaneously. Abandoned industrial and agricultural sites, artificial ponds that have begun to fill in, drained bogs, or exploited forests, when left to natural processes, begin to acquire intrinsic value that increases with time. The use of historical reference data in such situations would thus be inappropriate, on account of the many modifications these sites have undergone. Hobbes et al. (2006) refer to these as "novel ecosystems" that consist of new combinations of species in a habitat strongly affected by human activities.

Naturalness is a notion opposite to "patrimoniality," which introduces the idea of historical continuity (Larrère and Larrère, 1997). With naturalness, we propose conversely the idea of "disruption" in anthropogenic nature, whatever sentimental, aesthetic, or moral attachments there may be. Spontaneous species assemblages and links that would develop in heritage landscapes after abandonment thus remain strongly dependent upon previous human activities, due to the legacies left behind or the indirect influence they continue to exert on the surroundings (Génot and Barbault, 2004; Génot et al., 2005; Peterken, 1996; Sippi, 2004). Good examples of anthropogenic legacy are the astonishing memory of soil, which has conserved seed banks from former agricultural landscapes long after forests have recolonized the site (Bossuyt and Hermy, 2001; Hermy et al., 1999), and the invasion and persistence of exotic species in unmanaged areas, as well as the consequences of permanent

fragmentation of populations, climate change, or the long-term effects of chemical pollutants. Weisman's description (2007) of our world centuries or millenia after the extinction of man, is a convincing and frightening exercise.

Two new aspects emerge from the concept of naturalness: the acceptance of new trajectories that result solely from natural processes (the human role being limited to that of observer) and the desire to protect this nature in the future, whatever species assemblages there may be.

4. EXAMINING INTENSIVE MANAGEMENT OF BIODIVERSITY

4.1. *Conserving Crop Biodiversity at Any Cost*

Conservation initiatives for maintaining the biodiversity of heritage landscapes have been described as "eco-gardening" (Lemoine, 2005). Managers may propose introducing native species when they are declining, removing introduced species or pioneer woody species that invade open areas, transplanting rare species from an area that is going to be destroyed to a protected area, reviving former rural activities (use of extensive grazing by hardy cattle breeds, goats, or horses; encouragement of agricultural methods compatible with environmental concerns by subsidies to farmers). Of course, most of these initiatives are interesting in the short term, but they offer generally limited effectiveness in the long term if the deeper causes and underlying processes are not dealt with, and if related negative effects created by the new land uses remain.

4.1.1. *Example 1. Reinforcement of a Bird Population Without Prior Improvement of the Habitat*

The obsession with species decline after changes in land use has lead to other obvious excesses, mainly through increasing populations by artificial means (plantations for plants, artificial breeding for animals, installation of artificial nests for birds, even if the habitat is still degraded, or if the exact causes of the decline have not been analyzed; examples are numerous!) One example in France concerns the re-introduction of little bustard (*Tetrax tetrax*) individuals in sites where there has been a heavy population decline following agricultural intensification (from 7,200 singing males in 1979 to only 350 in 2004). Efforts have initially focused on promoting more extensive practices, but with very limited success (half the surface area is still intensively managed). However, the population reinforcement program has been accepted by the European Union, and integrated within a Life program (2004–2009). 300 young birds taken from remaining wild populations will shortly be released in the 5,164 area (Micol and Attié, 2007), even though the level of food resources has still not been improved.

4.1.2. *Example 2. Conservation of Species By Increasing Habitat Artificialization*

Wetlands are also often subjected to costly and questionable management. One interesting example, which is often part of ''restoration'' plans for large floodplains, is the construction of artificial nesting sites for colony-breeding waterbirds, when the habitat has been totally degraded. Herons, spoonbills, flamingoes, terns, cormorants, and pelicans often form large breeding colonies (up to several thousand individuals). Their nesting sites include large riparian trees, shrubs, or reedbeds (some Ardeidae species), and islands (Laridae, among others). Birds generally choose sites that are close to plentiful food resources, but that are also safe from predators (such as sites high up in trees, in dense vegetation, or surrounded by deep water). Many sites have been irreparably damaged by water systems engineering and other human activities; moreover the species have suffered from predation pressures and pollution. The solutions proposed by Perennou et al. (1996) to stop the decline of these spectacular species include the construction of canals with embankments, platforms, and artificial rafts in reservoirs; vegetation control through the manipulation of water levels, grazing, and fire; and planting ''desirable'' vegetation. In such cases, success may be achieved, but at the cost of still more artificialized landscapes.

The creation of ponds is another activity that managers are fond of. Of course, permanent or temporary ponds have dramatically decreased during the last decades because of river management, but is it necessary to re-create artificial small water areas locally, sometimes in sites where they have not naturally occurred if their proper management requires heavy equipment to prevent infilling? Some managers have even created a ''pond network'' where one can exchange ideas on how to create the ideal site. The objective of this type of management is simply to achieve the maximum number of species in a small space, with little future prospects if significant changes in river management do not take place in the future.

4.2. *Naturalness Rather Than Inappropriate Intervention*

4.2.1. *Example 1. Elimination of Natural River Dynamics to Improve Fish Biodiversity*

For many people, and particularly for local users, the natural characteristics of river ecosystems (flooding, accumulation of dead wood and of litter, heterogeneity in sediment deposits, development of uncontrolled, luxuriant vegetation), are considered as highly suspect: without human intervention, accumulation of dead wood turns the river into a marsh deprived of oxygen and of aquatic biodiversity. Following such logic, the East of France Fish's Association, has removed all living and dead wood along a small network of

well-preserved streams in the plain of Alsace, integrated within the Natura 2000 network. The result was disastrous: a decrease in food resources for Salmonidae (*Trutta trutta*) as well as other fish populations (*Cottus gobio*; *Lampettra planeri*) due to the disappearance of benthic fauna that need dead wood for support, and shelter against predators. Erosion has increased with removal of wood, followed by lowering of the mean water level and the covering of clay on gravels, which deprive Salmonidae of egg-laying sites.

4.2.2. *Example 2. Artificial Acceleration of Natural Forest Dynamics*

As it takes time for forests to become mature, some managers propose artificial methods for reaching the ideal state of old-growth as quickly as possible. An E.C. LIFE-Nature program was, for example, accepted in a relatively young forest in Italy (Cavalli and Mason, 2003): trees were intentionally felled, invasive trees were destroyed using explosives, and nests were built for birds and bats using chainsaws! Of course, such absurd initiatives are rare, but we have noted similar tendencies in other protected forests in France, along riverine forests: re-creation of pioneer stages by artificial cutting when the river can no longer ensure this essential function (Conservatoire des Sites Alsaciens, ONF 2004), even, for one forest island of the Rhine, plantation of elm hybrids (American × Asian hybrids) because native elms have disappeared as a result of Dutch Elm disease.

Such initiatives are highly debatable: forests are natural ecosystems that must recover stability, maturity, and resilience on their own, integrating the legacy of human activity whatever it has been. In the case of riverine forests, no human action can replace the complex role that rivers play in forest succession, maturity, and internal dynamics (Schnitzler, 2007).

4.3. *Fallow Land Versus Open Spaces*

The battle against the forest concerns some specific sites considered to be highly valuable habitats, i.e., boglands or meadows. There are even technical guides for the battle against trees, which recommend elimination by the use of chemicals despite the potential for ecotoxicity (Dupieux, 1998). Cubizolle and Sacca (2004) have, however, re-examined interventionist management for bogs, noting that the forested stage is simply part of the natural life cycle of a bog and not necessarily incompatible with the accumulation of peat. If left to evolve naturally, some bogs colonized by trees can also naturally recover an open state because of the paludification process (Duchamp et al., 2006 for the Vosges, Clément, 1987 for the bogs of Brittany).

Contrary to bogs, meadows are cultivated ecosystems that disappear if no longer grazed or cut. In France, the area of such forested surfaces has greatly increased in the last 200 years after abandonment of pastures or cultures, following social changes caused by wars, rural-to-urban migration, agricultural decline, economic crises, and, more recently, by fluctuations in the European Union's Common Agricultural Policy (Curt et al. 2004). Land surface-area went from 9 million ha in 1820 to more than 15 million ha in 2002 (if we do not include scrub or heathlands), of which approximately 17.6% (i.e., 2.7 million ha) corresponds to natural recolonization. This situation prevails in the mountainous areas of the Mediterranean.

The value of fallow land is rarely appreciated. When fallow land occurs in protected areas, there is general consensus that loss of biodiversity in these areas is regrettable, because the animal groups adapted to open spaces give way to other groups that are regarded as components of "ordinary" nature. This negative situation is heightened by the oppressive impression that the closing-in of the countryside creates. For many people, these forests also represent the end of the traditional rural society and ancestral knowledge (Luginbühl, 1999).

In the Cevennes mountains, 68% of the National Park territory is now forest, either massive plantations of pines (both exotic and native) at the end of the 19th century or spontaneous tree colonization on previous extensive pastures or grasslands. The major aim of the National Park is to guarantee conservation of the biodiversity associated with these extensive landscapes by providing subsidies to farmers who accept certain constraints in order to encourage agricultural methods. Given the cost of rehabilitation and the fact that complementary measures will no longer be practiced, i.e., pulling out all seedlings that germinate in pastures), it is highly probable that forest cover will continue to increase within the limits of the park in the following decades. Why not in this case recognize the value of this fallow land, which may moreover become Mediterranean oak forests, a rather rare habitat in the south of France? Fortunately, attitudes seem to be making gradual progress in other parts of the Mediterranean mountains, as is shown by some internal documents of Natura 2000 (Pic Saint-Loup, the Gorges de l'Ardèche, Cèze plateau), which promote the conservation and the protection of these young forests in a few areas.

Forest succession along river plains from ancient pastures is particularly rejected: for some scientists, young riverine forests would lead to biological poverty in the same way as intensive agriculture (Fustec and Lefeuvre, 2000)! Along the Loire, whose middle stretch has been classed as an UNESCO World Heritage Site, much positive action was undertaken to improve the functioning of the floodplain (opposition to dams, restoration of river dynamics and adjacent ecosystems, protection of remnant riverine

forests). However, spontaneous colonization of trees is still perceived as highly negative, and pastures or cuttings are promoted with financial help instead of natural, free forest colonization (Loire Nature, 2005–2006). Managers probably do not know that riverine forests are a natural part of river systems, and that their surface area must cover significant parts of the floodplain in order to play their ecological role correctly (Schnitzler, 2007).

Fallow land very quickly reaches interesting trophic levels, sometimes after only 50 years of spontaneous development. In the natural reserve (1,575 ha) of the gorges of the Ardèche (Rhône-Alpes and Languedoc-Roussillon regions), spontaneous young oak forests show an amazing diversity of saproxylic insects, which are very rare in managed forests. A recent census revealed 186 species of saproxylic beetles, which include the Giant Capricorn beetle (*Cerambyx cerdo*) and the European stag beetle (*Lucanus cervus*). These forests thus represent some of the most biodiverse forests in France, on a par with the renowned old-growth forest of la Massane in the eastern Pyrenees (Cochet, oral communication).

4.4. *The Problem of Exotics*

Human influence concerns also the increasing role of exotics in anthropogenic landscapes. The list of exotics (plants, bacteria, fungi, animals) introduced by man has been in constant increase since the beginning of the 20th century, and if they are abundant in man-made ecosystems, they also integrate natural systems that are still well-preserved. Moreover, some of them have become invasive, causing a substantial loss in biodiversity by outcompeting native species, and preventing success in restoration. Much restoration management thus sets out to fight against exotic invasions (i.e., by plant removal, destruction of birds' eggs, or chemical control of insect invasion), often with very limited success. Very little restoration work admits that proliferation of exotics masks another reality: man increases their capacity to invade by impoverishing habitats, modifying the climate or by introducing new pathogens, and refuses to stop such activities for economic reasons. The capacity to invade is a symptom of serious and irreversible ecological changes, connected with human activities. Nonetheless, these activities are rarely discussed in restoration efforts (Didham et al., 2005).

5. NATURALNESS: ANOTHER WAY FOR PROTECTION

Naturalness is widely accepted as a positive form of protection in the case of ecosystems that are still well-preserved such as old-growth forests (Fontainebleau, Massane for France), but also other ecosystems such as tropical forests, deserts, or the Arctic or Antarctic zones. Naturalness is also

accepted for protecting marine areas: for example, the Lavezzi reserve in Corsica contains a zone of 5,050 ha in which marine fishing is banned: everybody now recognizes that this zone is indisputably the richest zone for fish species compared to the other zones that are either partially protected or completely open to fishing (J. M. Culioli, 2006, Personal communication).

The problem is different when well-preserved, reference ecosystems have disappeared, and other ecosystems have developed over centuries. Arguments that the unmanaged development of nature confers high intrinsic value upon young fallow land, are only admitted by some scientists who have studied succession mechanisms in depth (Blanch, 1979; Panaoiotis, 1996; Tatoni et al., 1999; Marty and Lepart, 2001; Curt et al. 2004; Kunsler et al., 2006; Schnitzler, 2007). The value may also be recognized by some other users such as hunters or nature lovers (Terrasson, 1988, 1996; Luginbühl, 1999; Aspe, 2003).

The natural development of ecosystems, whatever their type (forest, bog, wetland, heathland) should be seen as a victory for biodiversity, an interesting subject for research and not as a failure of human society. Some of this may have important economic value, like wide areas of natural forests, because they will represent a potential carbon sink in a few decades, which will increase with the age of the forest (Schnitzler, 2002; Defos du Rau et al., 2005). They also protect and help restore forest soils. They play an important role in water conservation, especially in steep areas, and may help to buffer local climate extremes.

As ecosystem maturation takes time, it is important to have areas that are not fragmented with artificial openings, pastures, roads, or other human activities, and that are totally protected. Already covering enough surface (why not several thousand hectares for fallow land for example), these ecosystems will become (and to some extent, already are) a formidable response to the overdevelopment of the French landscape. When one considers the vastness of the young Mediterranean forests, which are developing on plateaux that used to serve as pastureland and the Rhône tributaries (e.g., the Ardèche, Cèze, and Gard), it is hard not to be in awe at the dynamic nature of these forests and their ability to return after many centuries of intensive clearing and resource exploitation.

These new systems will also provide a reference for future generations of the profound changes that have taken place in our current landscapes under demographic, economic, and climatic pressure. In this context, the answers these ecosystems will provide become very important, as they have been able to develop naturally, integrating indirect human influences. We thus argue instead for the case for a different direction for nature, one that would co-evolve with human societies, but does not depend on them for its

development. The acceptance of weeds, exotic species, woody species, and prolific animal species on a large portion of the landscape represents a sort of "decolonization" from nature created by humans for humans. In the present day anthropo-dominated world, wild ecosystems (even where there is anthropogenic influence) are valuable components of biodiversity, and must be protected along with the other ones.

This type of nature would encourage more humility and more efforts to prevent the persecution and displacement of species, management actions that are too focused, or stringent territorial zonation attempting to accommodate both biodiversity and industrial or urban development. This approach should be adopted more widely, from rural areas that have been strongly affected by intensive farming and forestry to the inner cities, where the battle against weeds is degrading soils and boosting the image of concrete and artificial green areas. This respect for nature and its processes have already taken root in cities such as Amsterdam and Dresden, which have banned the use of herbicides in certain parts of the city and are letting the plant communities evolve on their own.

To favor naturalness is to choose a far-sighted and holistic view of nature, which stands in contrast to the more traditional myopic view that has typically focused on very specific goals. The broad perspective of naturalness prevents arbitrary decisions and excessive subjectivity, while leaving room for the unforeseen and for spontaneity. Between the two extremes of focused management and non-intervention, there is a territory open and ripe for discussion and co-operation.

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